

# **Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study**

*Findings from First Peer Review Panel Meeting*

## **final report**

*prepared for*

**Metropolitan Transportation Commission**

*prepared by*

**Cambridge Systematics, Inc.**

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# 1.0 Introduction

The primary objective of the Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study is to inform the environmental analyses conducted by the California High-Speed Rail Authority (CHSRA), particularly on the subject of projected ridership and revenue. A new statewide travel demand model system was developed, designed expressly for the purpose of evaluating a proposed high-speed rail (HSR) system connecting major metropolitan areas between Southern and Northern California. The new model system was used to evaluate different HSR alignment options between the Central Valley and the Bay Area. Part of the scope of the study included holding a series of three peer review panel meetings to evaluate all major aspects of model development and application. The peer review panel enhances the credibility of the process by providing an objective and independent review of the models, assumptions, methodologies, and results.

While the reports and requests for their review were sent to the panel of participants that participated in the previous two peer review panel meetings, this peer review had a relatively smaller response. The panelists that participated in the third peer review meeting were:

- Jean-Pierre Arduin (independent consultant),
- Kostas Goulias, and
- Chris Brittle (independent consultant representing Metropolitan Transportation Commission (MTC)).

The first two peer review panel meetings were held in-person at the Cambridge Systematics offices in June 2005 and June 2006. The third peer review took place via e-mail exchange. This document summarizes and responds to the issues raised by the panelists, and is organized into two main sections, each representing one of the reports that the panel was asked to review:

- **Section 2.0** – Model Validation; and
- **Section 3.0** – Ridership and Revenue Forecasts.

Each section has a summary of the peer review panel along with responses.

## 2.0 Model Validation

The panel reviewed and responded to the information contained in the report, *Statewide Model Validation*, Cambridge Systematics, Inc., August, 2007.

### 2.1 GENERAL

There were several suggested points of clarification identified by the panel; they are responded to here.

One panelist wanted to know the difference in the definitions for Recreation and Other trips in the interregional model, with a particular question about where visiting family and friends would fit in. In the context of the interregional statewide model, “visiting friends and family” is classified as an “other” trip, as opposed to “recreation.”

Reporting on the market segments often refers to a LA to SF market. One panelist correctly pointed out that this should be labeled LA to and from SF.

There were several suggestions for table re-labeling and areas where more clarity was needed.

### 2.2 MODEL STRUCTURE

A reviewer commented about his agreement with the use of the distinction of intraregional and interregional travel for the purposes of high-speed rail and the use of a generalized cost.

### 2.3 OBSERVED DATA

Panelists had several questions about the source and validity of the observed data sources that were used to calibrate and validate the interregional model.

The panel suggested that additional surveys be performed to better understand the situation; however, this is outside the scope of this study.

A panelist suggested that the year 2000 validation targets for air passenger trips should have relied to a greater degree on the year 2000 and year 2005 DOT ticket samples, and to a lesser degree on American Travel Survey (ATS) results. In order to develop purpose-specific estimates for validation purposes, it was necessary to rely on a combination of the DOT ticket sample data and the ATS, which included trip characteristics information. The two sources disagree to some extent about the amount of true intrastate origin-destination air travel. Both sources are subject to sampling errors, since neither is a census of travelers, and both sources are subject to nonrandom biases. The ATS survey required

participants to recall trips they had made in the recent past, so some inaccuracies and misreporting would be expected. The 10 percent ticket sample is required of all large carriers, but the level of reporting by smaller carriers varies, depending on the ticketing relationship with other carriers and on the ticket purchase channel. The targets that were used represent somewhat of a compromise between the alternative sources. The significant changes in air passenger demand between 2000 and 2005 (when air passenger choice data were collected) affected both the amount of air travel and the composition of the air travel market, so the market segment-specific validation targets for air passenger trips try to reflect these composition changes. As the panelist notes the forecast growth rate in interregional air trips is lower than for other available forecasts, so the higher validation targets for the base year help to mediate the differences between these other forecasts.

A panelist pointed out that there were no “short” (less than 100 miles) air trips in the observed air data, and wondered where trips to/from SFO/SMF and several other airport pairs were accounted for. All observed air trips are assumed to be “long” or over 100 miles, and are accounted for in this part of the table.

## **2.4 ECONOMIC ASSUMPTIONS**

Panelists observed that there was no documentation about the forecast demographics and future network and transportation supply for the future year. The socioeconomic forecasts are consistent with the metropolitan planning organization (MPO) and the State of California forecasts and, therefore, assume all of their caveats and assumptions. The future year transportation supply for 2030 was defined by financially-constrained long-range plans, and is documented in the report, *LOS and Forecast Assumptions*, Cambridge Systematics, Inc., August, 2006.

## **2.5 CALIBRATION RESULTS**

There was general agreement that the calibration of the interregional models was acceptable. However, there was concern that the LA to and from SF market was not going up enough between 2000 and 2030. This market has a great deal of congestion and suffers from a lack of accessibility, which suppresses the growth of travel between these regions.

The reviewer did not see the reference situation presented in the report – the situation that would prevail if the project is not realized. All 2030 results presented in the Model Validation report refer to the reference situation, which is also referred to as “2030 No Build.”

## **2.6 INDUCED TRAVEL**

One reviewer did not clearly see the presence of induced travel in the Model Validation report and, therefore, assumed that the California Statewide Model for High-Speed Rail does not take induced travel into account. The California Statewide Model for High-Speed Rail does take into account the induced interregional travel resulting from increased accessibilities. However, the Model Validation report does not reference induced travel, because it only deals with “no project” alternatives. The induced travel due to the availability of high-speed rail is apparent in the Ridership and Revenue Report.

## 3.0 Ridership and Revenue Forecasts

The panel reviewed and responded to the information contained in the report, *Ridership and Revenue Forecasts*, Cambridge Systematics, Inc., August, 2007.

### 3.1 INTERREGIONAL TRIP FREQUENCY

One reviewer pointed out the relatively low number of interregional trips that are forecast compared to several other forecasts done for aviation purposes by MTC and the Federal Aviation Administration (FAA). In particular, the growth rate of interregional air trips forecasts has roughly one-half the growth rate as the FAA's latest forecast, and slightly lower than the "low-forecast" range in the MTC's 2000 Regional Airport System Plan. The forecasts of air passenger growth were constrained in part by the input assumption that airline scheduled flight frequencies would remain the same as in 2005. While this assumption may be over simplistic, we believe it is more rational than assuming some arbitrary increase in these frequencies.

The reviewer suggested the development of a separate air travel forecast to check the reasonableness of the California Statewide Model for High-Speed Rail using cost per passenger mile as one of the key variables. We agree that this would be a useful extension to the model system; it is outside the scope of this study.

### 3.2 INPUT ASSUMPTIONS

Reviewers requested more comparisons and summaries of the level-of-service assumptions for all modes. The Bay Area Environmental Impact Statement Report Environmental Impact Statement (EIR/EIS), available on the CHSRA web site ([http://www.cahighspeedrail.ca.gov/eir\\_final/Default.asp](http://www.cahighspeedrail.ca.gov/eir_final/Default.asp)), details the assumptions made about HSR service. Input assumptions about other modes are detailed in *LOS Assumptions*, Cambridge Systematics, Inc., August 2006.

### 3.3 SENSITIVITY TESTS

Several suggestions for further sensitivity tests were made. There were concerns about the relatively low high-speed rail fares compared to airfares. While not part of this study, subsequent work will test different high-speed rail fare strategies, as well as a variety of future year airfare and auto cost situations.

Further explanation was requested for the results of Sensitivity Tests 3 and 5 in Table 3.2 of the report, where the HSR, Air, and Auto costs were all increased by



the same percentage (35 percent for Test 3, and 75 percent for Test 5). The result in both cases was a 35 percent increase in the HSR ridership. This indicates that the higher fares do not have as much impact on the utility of high-speed rail compared to other modes.

There was some confusion about Section 3.0 pertaining to the reference situation for the sensitivity tests. The “2000 Business Plan” is not, in fact, the 2000 base year modeling scenario, but refers to the business plan of the CHSRA that was developed in the year 2000, which is actually a 2030 scenario.

### **3.4 AIR TRIPS**

One reviewer pointed out a discrepancy in Tables 7.6 and 7.8 in the number of air trips for the 2030 base scenario between the output of the mode choice model and the number of air trips assigned. Some rounding issues occur in the airport, high-speed rail, and conventional rail assignment process (not more than one percent).

### **3.5 DIVERSION**

A comment was made that there does not appear to be a way to determine the number of air passengers that are diverted from a particular airport. Specific airport-to-airport assignments are done; however, the results were not reported to this level of detail due to a number of reasons – the foremost being formatting and space.

It was pointed out that the projected diversion of air travel to high-speed rail (36 percent) assumed very favorable assumptions about high-speed rail fares. However, this diversion was less than that of the previous study’s air diversion rate of 56 percent. The reviewer also pointed out that they would expect the Pacheco Pass alternative to divert more air trips due to its superior connection between SF and LA markets (a large air market).

One reviewer expected the diversion from Conventional Rail (CVR) to HSR to be higher, but agreed with the overall results.

### **3.6 FORECASTS**

One reviewer asked about what annualization factor was used to get annual boardings and revenue. A value of 365 was used because the base year intercity travel volume estimates do not distinguish by weekday and weekend, and because intercity travel service is generally not reduced during holiday periods.

The average fare per passenger was thought to be quite low. This is due to the high level of intraregional trips projected to use the HSR system, and their relatively lower pricing structure for fares.

One panel member commented that proportion of business trips and overall forecast levels of the forecasts have a great level of credibility in comparison with other similar forecasts. They further mentioned that they accepted these results as credible, because they are based on cautious and prudent assumptions and used proven methods.